DOCUMENT RESUME

ED 037 940 EF 004 108

TITLE	Building Standards for the Handicapped, 1965. Supplement No. 7 to the National Building Code of Canada.
INSTITUTION	National Research Council of Canada, Ottawa (Ontario).
REPORT NO	NRC-No-8333
PUB DATE	65
NOTE	24p.
AVAILABLE FROM	The Secretary, The Associate Committee on the National Building Code, National Research Council, Ottawa, Canada ($.25)
EDRS PRICE	EDRS Price MF-$0.25 HC-$1.30
DESCRIPTORS	*Architectural Barriers, Building Design, Building Equipment, Design Needs, Dining Facilities, Parking Areas, Performance Specifications, *Physically Handicapped, *Public Facilities, Signs, *Site Development, *Standards, Toilet Facilities

ABSTRACT

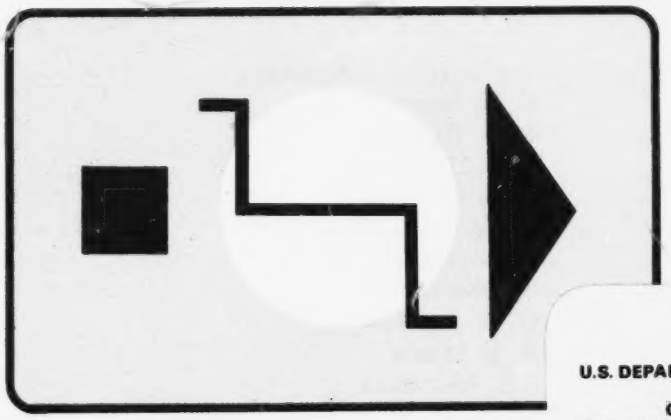
Guidelines for incorporating provisions for the physically handicapped into the design and construction of public facilities are reviewed. Performance criteria and recommendations are given for facility planning, site development, and building equipment. Hazards and safety precautions are discussed, with specifications for architectural elements such as toilets, utilities, ramps, stairs, parking, and storage areas. A reference list is included. (TG)

ED037940

SUPPLEMENT No. 7
to the NATIONAL BUILDING CODE of CANADA

BUILDING STANDARDS FOR THE HANDICAPPED

1965



U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

EF 004 108

Issued By:
THE ASSOCIATE COMMITTEE on the NATIONAL BUILDING CODE
NATIONAL RESEARCH COUNCIL • OTTAWA • CANADA

NRC No. 8333
Price 25 cents

ASSOCIATE COMMITTEE ON THE NATIONAL BUILDING CODE

1964-1965

R. F. LEGGET (*Chairman*)
E. A. ALLCUT
D. C. BEAM
A. E. BRIDGES
A. J. CAMERON
S. D. C. CHUTTER
A. F. DUFFUS
J. J. DUSSAULT
H. ELDER
J. H. JENKINS
J. S. JOHANNSON
S. D. LASH
G. C. LOUNT
J. P. LUPIEN
H. H. G. MOODY
G. S. MOONEY*
A. T. MUIR
J. H. PALMASON
B. PELLETIER
R. B. ROLLAND
S. A. SASSO
A. TUBBY
A. E. BERRY (*ex officio*)
R. E. BOLTON (*ex officio*)
J. L. DAVIES (*ex officio*)
C. G. E. DOWNING (*ex officio*)
D. T. WRIGHT (*ex officio*)
J. M. ROBERTSON (*Secretary*)

COMMITTEE ON BUILDING STANDARDS FOR THE HANDICAPPED

I. CAMPBELL (*Chairman*)
C. N. BENNETT
B. R. BROWN
M. G. P. CAMERON
K. B. DAVISON
M. G. DIXON
J. DOTTRIDGE *(Mrs.)*
F. HOWARD *(Miss)*
D. W. JONSSON
A. T. MANN
J. L. MELVILLE
G. PECK (*Corresponding Member*)
K. H. RUNNING (*Deceased*)
L. C. SMITH *(Mrs.)*
W. B. WATSON (*Secretary*)

*Deceased July 1965.

FOREWORD

One in every seven Canadians has a permanent physical disability or an infirmity associated with aging

Many handicapped persons, in an effort to participate in community life and to contribute to the economy of the nation, have become frustrated by the present design of public buildings and facilities. As a result of this, strong representation by persons and organizations concerned with the problems of the handicapped brought about the development of **Building Standards for the Handicapped, Canada, 1965,** which is published as a supplement to the National Building Code of Canada.

Following exploratory meetings between representatives of the Department of Labour and the Department of National Health and Welfare, a request was made to the National Research Council that the project of developing the standards be assigned to the Division of Building Research.

The Associate Committee on the National Building Code considered this request in May 1963 and accepted the task of preparing an advisory document for use in Canada. The Committee on Standards for the Handicapped was then formed to identify the problems of the handicapped, study their import and work out acceptable solutions. The extensive research already carried out into this subject by the American Standards Association and other groups has been beneficial to this Committee in the preparation of these standards.

As a supplement to the National Building Code of Canada this document has no automatic mandatory position when the Code is adopted for use by federal, provincial or municipal governments. The supplement is written as a guide for those interested in the design and construction of buildings with provisions for making them usable by the physically handicapped.

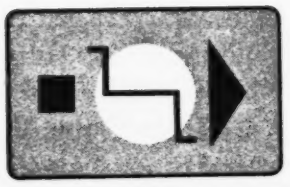
The word "shall" is used in several instances to emphasize the importance of certain key requirements but for the most part the requirements are recommended minima. The words "shall" and "should" are used to differentiate between the essential and desirable requirements in these Standards.

The recommendations contained herein are based on average needs and acceptable norms. Where particular disability problems are concerned, this document can be used only as a guide to the general problem.

It is to be noted that implementation of the Standards will in no way detract from the normal use of buildings or facilities by those who are not handicapped. In fact, it will make buildings more accessible and safer for all

who use them while ensuring for the handicapped and the aged a happier, fuller and more productive life.

The insignia shown on the front cover was designed for use as a directional sign to building entrances usable by semiambulatory and nonambulatory persons. It is also intended to serve as an identification symbol on all facilities provided for the handicapped.



REFERENCES

The Associate Committee wishes to acknowledge gratefully the assistance obtained by the Committee on Building Standards for the Handicapped from the following publications; if any information has thus been used for which prior formal permission should have been obtained, this has only been done in the common task of assisting the physically handicapped, and regret is recorded for any such omission.

American Standards Association.
Making Buildings and Facilities Accessible to and Usable by the Physically Handicapped. Specification A117.1–1961. Chicago, 1961.

Goldsmith, Selwyn. Designing for the Disabled, London, Royal Institute of British Architects, 1963.

Muller, Henrik. Rorelsehindrades stadsbygdsmiljoen studie fran Högdalen. (City Suburb and Environement for Disabled Persons — a study of Högdalen). Stockholm, 1961.

Salmon, F. Cuthbert and Christine F. Salmon. Rehabilitation Center Planning, University Park, Pennsylvania State University, 1959.

Those requiring further information on the design and construction of buildings and facilities for the handicapped may refer to Bibliography #26 "Building for the Handicapped", published by the Division of Building Research of the National Research Council.

CONTENTS

		Page
Chapter 1	PURPOSE AND SCOPE	5
Chapter 2	DEFINITIONS	5–6
Chapter 3	GENERAL DESIGN INFORMATION	6–7
Chapter 4	SITE DEVELOPMENT	8–10
Chapter 5	BUILDINGS	11–18
	INDEX	19–20

CHAPTER 1 - PURPOSE AND SCOPE

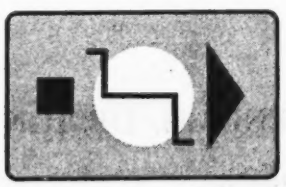
1.1 Purpose

1.1.1 These Standards, supplementing the National Building Code of Canada, are intended to make public buildings accessible to and usable by the physically handicapped without assistance. The application of these Standards in the construction or remodelling of buildings used by the public will help the physically handicapped to participate in many additional community activities.

1.2 Scope

1.2.1 Chapters 1 to 5 of these Standards apply to all buildings and facilities used by the public. They incorporate safety factors of value to all and of particular significance when designing buildings for industry.

1.2.2 These Standards are concerned with the use of buildings by persons with nonambulatory and semiambulatory disabilities, disabilities of sight, hearing and coordination, and disabilities of the aged.



CHAPTER 2 - DEFINITIONS

2.1 Definitions of Words and Phrases

Nonambulatory disabilities: Impairments that, for all practical purposes, confine persons to wheelchairs.

Semiambulatory disabilities: Impairments that cause persons to walk with difficulty or insecurity. Persons using braces or crutches, amputees, arthritics, spastics, and those with pulmonary and cardiac conditions may be semiambulatory.

Sight disabilities: Total blindness or impairments affecting sight to the extent that a person is insecure or exposed to danger.

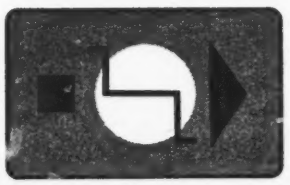
Hearing disabilities: Total deafness or impairments affecting hearing to the extent that a person is insecure or exposed to danger.

Coordination disabilities: Impairment of purposeful muscle control in the limbs, to an extent that the person is insecure or exposed to danger.

Disabilities of aging: Those manifestations of the aging process that significantly reduce mobility, flexibility, coordination, and perceptiveness but are not accounted for in other disabilities.

Ramp: An inclined plane leading from one level to another.

Walk: An exterior pathway with a prepared surface placed at existing ground level.



CHAPTER 3 - GENERAL DESIGN INFORMATION

3.1 Designing for Children

The dimensions given in these Standards are for adults of average stature. In designing buildings for use by children, it may be necessary to alter some dimensions, such as height of handrails, according to the age group.

3.2 Wheelchair Dimensions

Standard models of commonly used wheelchairs vary between the following dimensions:

Length:	38½–41½ in.
Width when open:	24 –27¾ in.
Width when collapsed:	9½–12 in.
Height of seat from floor:	19¼–20½ in.
Height of armrest from floor:	28 –30 in.
Height of rear pusher handles from floor:	35 –37½ in.

3.3 The Functioning of a Wheelchair

3.3.1 The average turning space required (180 degrees) is 5 ft. - 0 in. by 5 ft. - 0 in.

3.3.2 The minimum turning space required for a 360 degree turn in a corridor is 4 ft. - 6 in. between walls.

3.3.3 A minimum width of 5 ft. - 0 in. is required for two wheelchairs to pass each other.

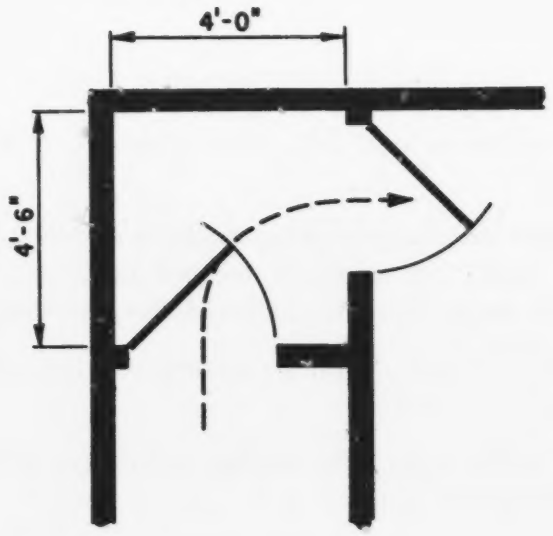


Figure 1
EXAMPLE OF DIMENSIONS REQUIRED FOR 90° TURN IN WHEELCHAIR

3.4 Functioning of an Adult in a Wheelchair

3.4.1 The average upward reach with one arm is 60 in. from the floor and ranges from 54 in. to 78 in.

3.4.2 The average horizontal working reach at a bench or table is 18 in. beyond the front of the working surface.

3.4.3 The average horizontal reach, both arms extended to each side, shoulder high, is 64.5 in. and ranges from 54 in. to 71 in.

3.4.4 In reaching forward diagonally, as when using a wall-mounted dial telephone, the average person can reach a point 48 in. from the floor.

3.5 Functioning of a Person on Crutches

When walking with a normal gait, the distance between crutch tips ranges from 30 to 33 in. depending on the height of the person.

Further information for design (indicated in italics throughout the appropriate Sections of each Chapter) is included to supplement the Standards and is provided to assist the designer using this document.

CHAPTER 4 - SITE DEVELOPMENT

Site development is a most effective means of resolving the problems of access to buildings by the handicapped. The effective use of terracing, retaining walls, and winding walks for a more gradual incline can make almost any building accessible to disabled persons.

4.1 Walks

4.1.1 Walks should be at least 5 ft. - 0 in. wide with a maximum gradient of one in twenty.

It is essential that the gradient of walks be less than that prescribed for ramps, as walks are normally without handrails or curbs and are considerably longer and more vulnerable to the elements.

4.1.2 Walks should be of a continuing common surface, not interrupted by steps or abrupt changes in level.

4.1.3 Wherever walks cross other walks, driveways or parking lots they should blend to a common level.

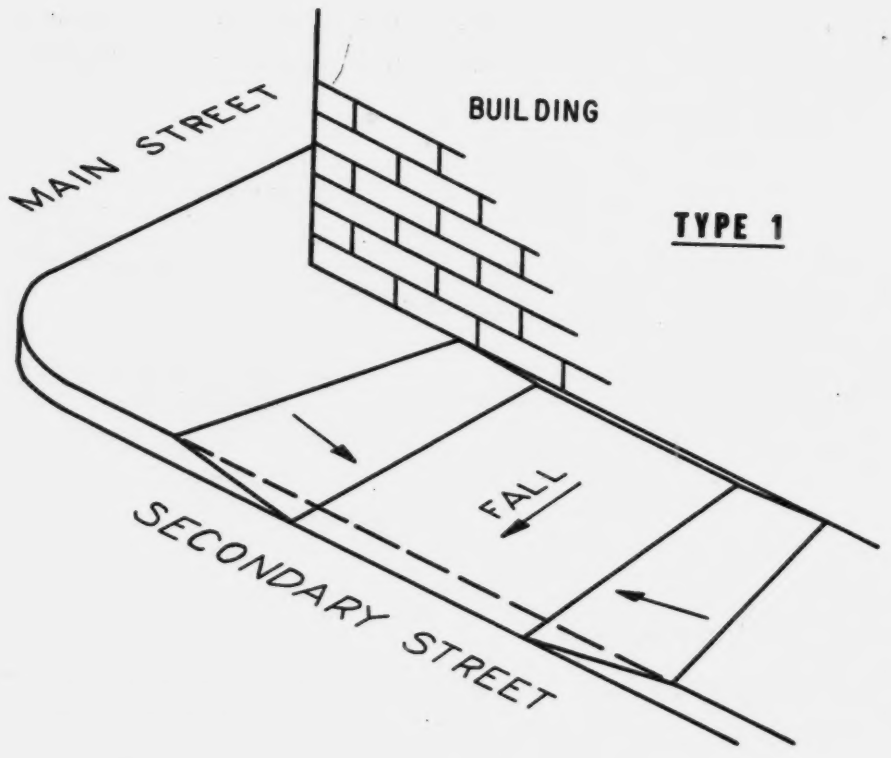
4.1.4 Where walks cross a curb, the curb should be cut and the walk ramped to road level.

Ramping of Walks — Where curb cuts and ramped walks are provided in accordance with Subsection 4.1.2, they should lead on to roads carrying the lesser vehicular traffic. The walk should be cut down, rather than building up the street pavement, and curbs should be provided on each side of the ramp to assist blind persons.

4.1.5 Walks of near maximum grade and considerable length should have level areas at intervals for purposes of rest and safety.

4.1.6 Walks should have nonslip surfaces.

Nonslip surfaces — The provision of nonslip surfaces on steps, walks and floors greatly assists those persons who are handicapped with semi-ambulatory disabilities. Nonslip surfaces may be provided by the use of many standard finishes and materials. Concrete walks can be prepared by brushing the surface to expose the aggregate, or by finishing with an indenting roller.



PREFERRED MAX. SLOPE 1:12
1:7 MAY BE USED FOR SHORT
RAMPS WHERE NECESSARY.

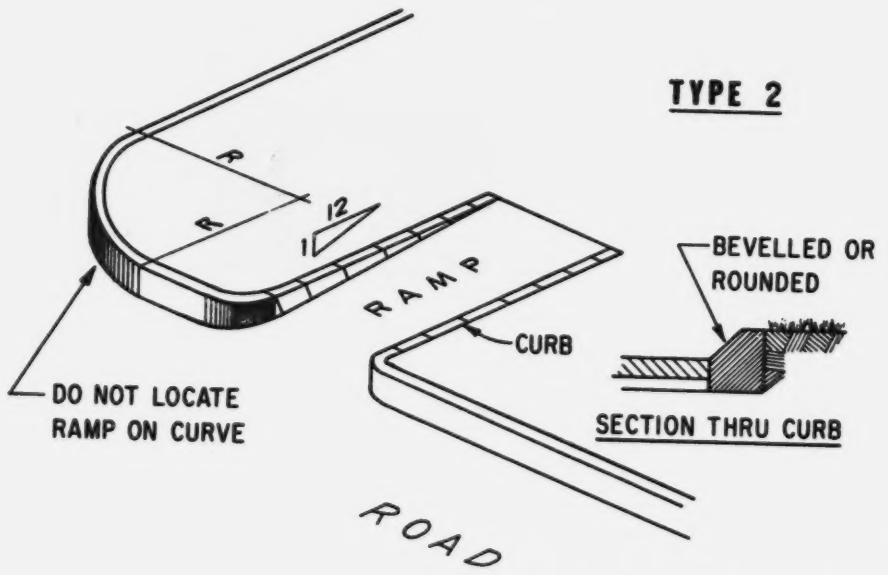


Figure 2
RAMPING OF WALKS

4.1.7 When the gradiant of a walk must exceed one in twenty, then it will be considered to be a ramp and the requirements of Subsections 5.3.1 and 5.3.3 should apply.

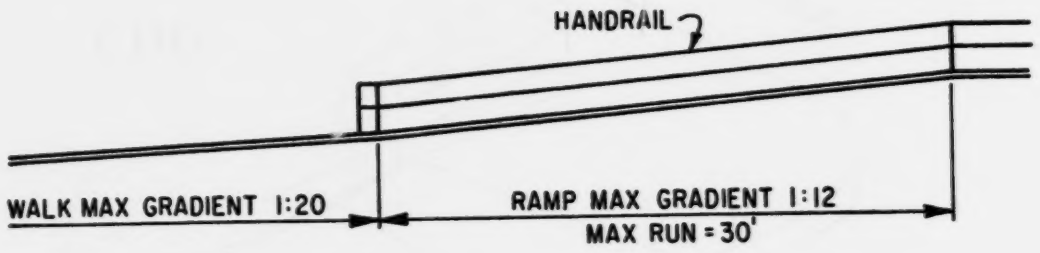


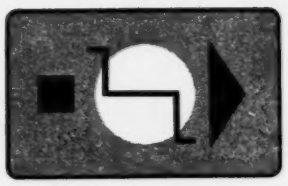
Figure 3

4.2 Parking Lots

4.2.1 Conveniently located parking spaces such as end stalls should be reserved and identified for use by persons with physical disabilities.

4.2.2 Where possible, walkways from such parking spaces should be located so that persons with semiambulatory disabilities or in wheelchairs do not pass behind parked cars.

4.2.3 Parking spaces other than end stalls should be 12 ft. wide, situated on level ground.

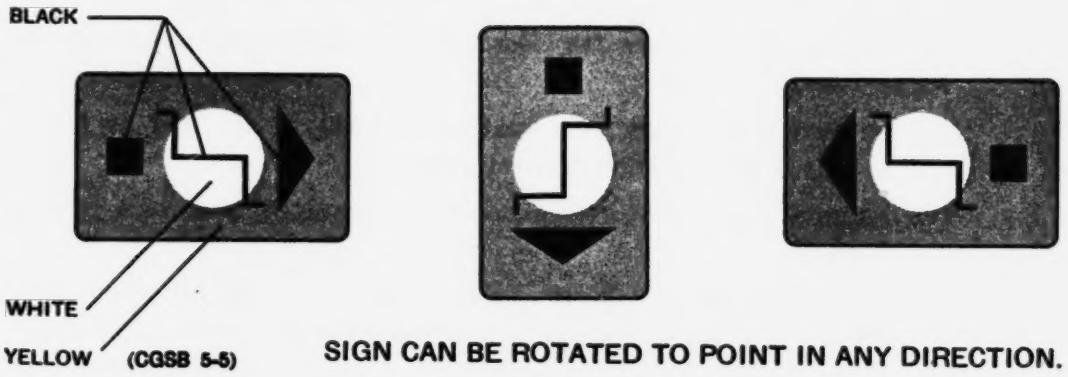


CHAPTER 5 - BUILDINGS

5.1 Entrances

5.1.1 At least one primary entrance to each building shall be usable by persons in wheelchairs.

5.1.2 When the main entrance of a building is not usable by the handicapped, then a sign, pointing to a ground level entrance, should be installed in front of the building.



Exits — Exits should be provided in accordance with Subsection 3.4.2 of the National Building Code of Canada.

5.2 Doors and Doorways

5.2.1 Doorways shall have a clear opening free of protruding hardware of at least 2 ft. - 6 in. when the door is open. Doors shall have a minimum width of 2 ft. - 8 in.

5.2.2 In a two-leaf door, one of the leaves shall meet the requirement of 5.2.1 except where both leaves operate by a single effort.

5.2.3 Interior thresholds should be flush with the floor, and exterior thresholds should not exceed ½ in. in height.

5.2.4 Door closers, if required, should be of a type to permit opening of the door with a minimum effort and slow closing to allow uninterrupted passage of a wheelchair. They should be so placed they do not interfere with the passage of persons on crutches or in wheelchairs.

When automatic door closers are not used, an auxiliary handle should be located on the push side, 7 in. from the hinged edge of the door, so the door may be closed by a person in a wheelchair.

Door handles — Lever type door handles are preferred for persons with with impaired grip.

5.2.5 Vestibules shall be designed to allow free movement of a wheelchair between the doors. See Figure 1.

5.2.6 If revolving doors are used, an auxiliary side hung door shall be provided as required in Subsection 5.2.1.

5.3 Ramps and Stairs

5.3.1 Ramps

(a) Ramps shall have a maximum gradient of 1 in. per ft.

(b) Ramps shall have a nonslip surface.

(c) Ramps shall have a minimum width of 3 ft. - 0 in.

(d) On any ramp leading to a door, a level area 5 ft. - 0 in. by 5 ft. - 0 in. shall be provided at the top, with the extra width projecting beyond the latch edge of the door.

In special cases, where the door opens inwards, the depth can be reduced to 3 ft. - 0 in.

(e) Ramps shall have level platforms 4 ft. - 0 in. long at 30 ft. intervals and at each turning point.

(f) Ramps shall have at least 6 ft. of straight clearance at the bottom.

(g) Where steeper gradients are unavoidable ramps for wheelchair use may be constructed to a maximum slope of 1 in 7, provided there are two handrails spaced 2 ft. - 10 in. apart and provided the length of one run does not exceed 30 ft. Such ramps shall be marked 'Wheelchairs Only'.

Protection of Ramps — Ramps should be located inside the building where possible. When it is necessary to locate them outside, it is desirable to protect ramps from snow and ice accumulation. This may be accomplished by providing a roof over the ramps or by installing snow-melting devices.

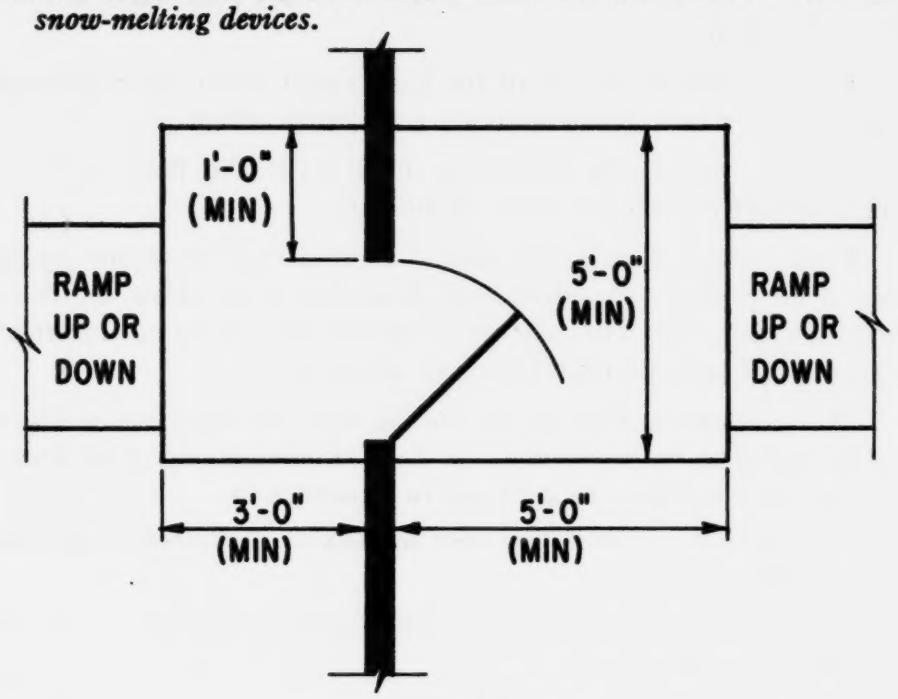


Figure 4
LEVEL AREAS REQUIRED AT END OF RAMPS LEADING TO DOORWAYS

5.3.2 Stairs

(a) The ratio of riser-to-tread dimensions of stairs should conform to standard riser-to-tread formulae and have a maximum rise of 7 in.

(b) Stairs should have plain faces. Open risers, or edges projecting out over the face of closed risers are not recommended.

(c) Stairs should have nonslip surfaces.

Stair Finishes — Terrazzo stairs can be finished with aluminum-oxide abrasive to make them nonslip and stairs of wood or steel may be covered with premoulded treads or carpeting material.

Figure 5
STAIRS

5.3.3 Handrails

(a) Ramps shall have handrails on at least one side, and preferably two sides, 2 ft. - 8 in. in height, measured vertically from the surface of the ramp. One handrail shall extend one foot beyond the top and bottom of the ramp.

(b) Stairs shall have handrails preferably on both sides, 2 ft. - 8 in. in height measured vertically from the nose of the tread. One handrail shall extend 1 ft. - 6 in. beyond the top and bottom steps.

Handrail Extension — The handrail extension should be made on the side of a continuing wall, or otherwise designed so that it does not constitute a hazard.

5.4 Vertical Transportation

5.4.1 Public use elevators should be provided in buildings of more than two storeys and are desirable in the latter.

5.4.2 When elevators are provided, they shall be accessible to and usable by the handicapped, including those in wheelchairs, both at the entrance level and at all levels normally used by the public.

Automatic elevators should have slow-acting doors. Call buttons and operating controls should be located not more than 4 ft. - 0 in. above floor level.

5.4.3 Handrails should be provided on three sides of the elevator car.

5.4.4 In two storey buildings, if elevators or ramps are not provided

(a) all public space should be located on the ground floor, or

(b) interview or reception space for upper floor offices should be provided on the ground floor.

5.5 Floors

5.5.1 Floors on a given storey shall be of a common level throughout or connected by a ramp in accordance with Section 5.3.

5.5.2 Except at entrances not intended for use by the handicapped, the floor on the inside and outside of a doorway shall be level. This level area shall extend

(a) at least 1 ft. beyond the latch edge of the doorway.

(b) 5 ft. in the direction that the door swings.

(c) 3 ft. in the opposite direction.

Floor Finishes

It is essential that the finish of all floors should have nonslip qualities, even when standard flooring materials are used.

Highly polished finishes should be avoided.

Particular attention should be given to the selection of materials used on vestibule and entrance hallway floors as these may become dangerous when wet.

A minimum of wax should be used in the maintenance of floors to prevent surplus amounts being transferred to the soles of shoes. Nonslip waxes, containing fine abrasive particles are recommended.

5.6 Toilet Rooms

5.6.1 Where toilet rooms are provided for the public, they shall be designed to allow traffic of wheelchairs.

5.6.2 Toilet Stalls

Toilet rooms shall have at least one toilet stall that

(a) is at least 3 ft. - 0 in. wide and 4 ft. - 8 in. min. in depth.

(b) has a 2 ft. - 8 in. wide door that swings outwards, preferably against a side wall.

(c) has the water closet located at one side, 1 ft. - 6 in. from centre of fixture to the side wall.

(d) has a grab bar on both sides, 2 ft. - 9 in. high and parallel to the floor, 1½ in. in outside diameter, with 1½ in. clearance between rail and wall, fastened securely to the wall, and

(e) has a water closet that conforms with the requirements of Section 5.6.3.

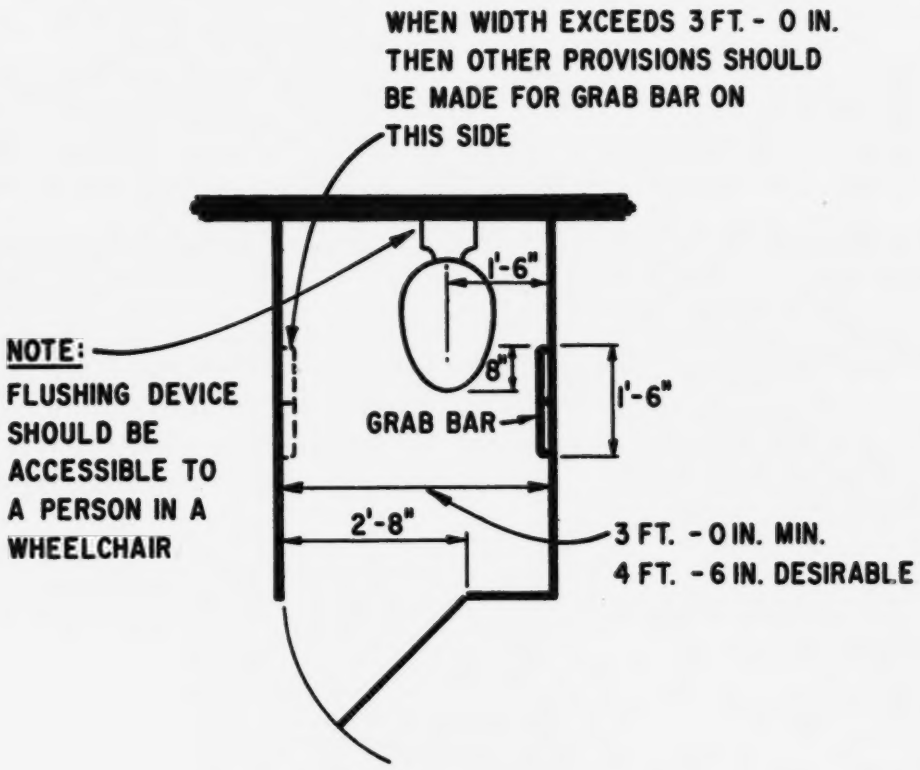


Figure 6
TOILET STALL FOR THE DISABLED

Toilet stalls of adequate size for the handicapped can be provided in existing buildings by combining two standard stalls into one as shown in Figure 7. The common partition and one water closet should be removed and a door provided in accordance with Subsection 5.6.2(b).

5.6.3 Water Closets

Water closets for the handicapped shall be mounted so that the top of the seat is 1 ft. - 8 in. above floor level.

Design of Water Closets — Water Closets should be of a design to allow the approach of a wheelchair without obstructing the footrest. Wall mounted fixtures are preferable, but some floor models with receding understructures may also be suitable. Flushing control handles should hand operated and easily accessible to a person in a wheelchair.

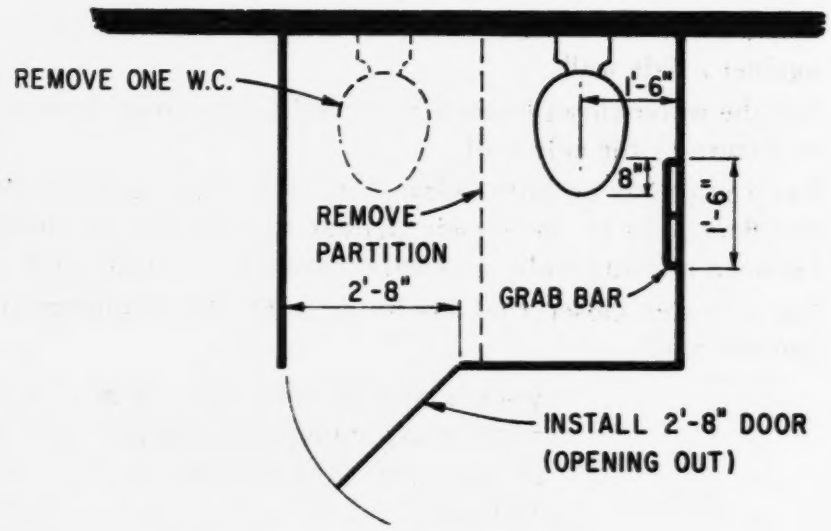


Figure 7
CONVERSION OF 2 STANDARD TOILET STALLS FOR USE BY DISABLED

5.6.4 Wash-Basins

(a) Wash-basins should be wall mounted, without legs or pedestals.

(b) Wash-basins should have a minimum clearance of 2 ft. - 2 in. under the apron and bowl to a point 10 in. from the front of the fixture, when mounted with the top at standard weight.

Lever type faucet handles are preferred.

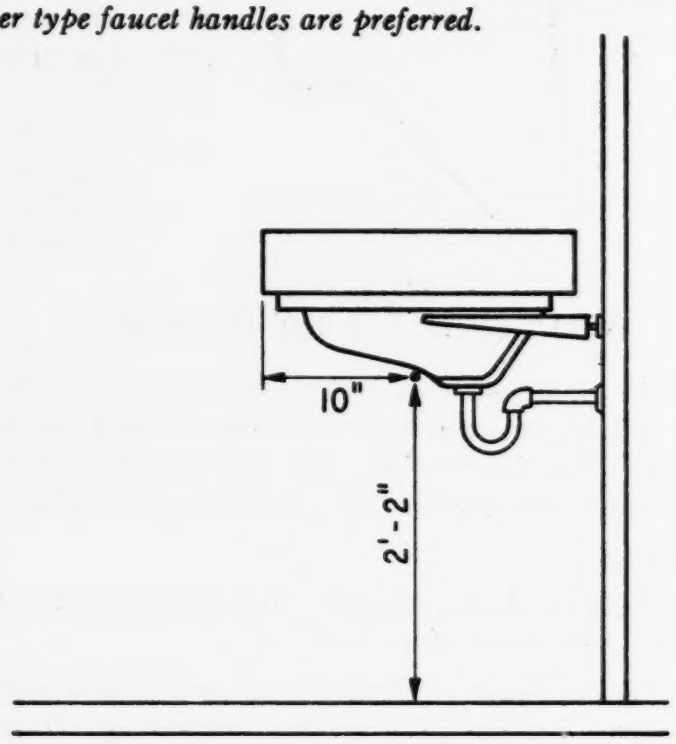


Figure 8
WASH BASIN USABLE BY A PERSON IN A WHEELCHAIR

5.6.5 Urinals

(a) Floors under urinals should be level with the main floor of the toilet room.

(b) The opening of the basin of wall mounted urinals should be 1 ft. - 7 in. above the floor.

5.6.6 Accessories

(a) Mirrors and shelves should be provided above lavatories at a maximum height of 3 ft. - 2 in. from the floor to the bottom of the mirror and the top of the shelf.

(b) Towel racks, towel dispensers, disposal units, toiler paper dispensers, electric hand dryers and soap dispensers should be mounted at a maximum height of 3 ft. - 4 in. from the floor.

5.7 Water Fountains

5.7.1 Water fountains or coolers should have up-front spouts and hand-operated controls.

5.7.2 Wall mounted coolers should be mounted with the basin 3 ft. - 0 in. above the floor.

5.7.3 If floor mounted water coolers more than 3 ft. - 0 in. high are used, then a paper cup dispenser for the handicapped should be mounted 3 ft. - 0 in. above the floor.

Recessed Water Fountains — Fully recessed water fountains are not recommended. If a fountain is set into an alcove, then the alcove should be wider than a wheelchair.

5.8 Public Telephones

Telephone Booths — The conventional public telephone booth is not usable by most physically disabled persons. It is recommended that architects and builders confer with the telephone company in the planning of the building to determine the type of equipment to be used.

5.8.1 Where public telephones are provided, at least one should be

(a) located in a booth or enclosure that can be entered by a person in a wheelchair.

(b) mounted so that the dial, handset and coin deposit slots are not more than 4 ft. - 0 in. above the floor.

(c) equipped with an amplifier on the receiver.

5.9 Cafeterias

Cafeterias should be designed to allow passage of a wheelchair through the food service lanes and between tables. Cutlery and food display racks should be visible and within reach of a person seated in a wheelchair.

5.10 Controls

5.10.1 Switches and controls for lights, heating and ventilation equipment, windows, draperies, fire alarms and all similar controls of frequent or essential use should be placed within reach of persons in wheelchairs and should be of a type that may be easily operated by the disabled. Utility receptacles should be at least 1 ft. - 6 in. above the floor.

5.11 Lighting

5.11.1 A minimum illumination level of 5-foot candles shall be provided on exterior ramps.

5.12 Warning Signals

5.12.1 Where it is practical,

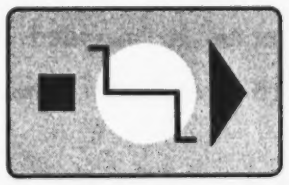
(1) Emergency audio warning signals should be accompanied by simultaneous visual signals for the benefit of those with hearing disabilities, and

(2) Emergency visual warning signals should be accompanied by simultaneous audio signals for the benefit of the blind.

5.13 Hazards

Every effort should be made to eliminate hazards which may cause injury to those with physical disabilities.

Objects such as door closers, lights and signs projecting into corridors or doorways should be mounted at least 6 ft. - 6 in. above the floor.



INDEX

Accessories, toilet rooms 17
Amplifiers, on public telephones 17
Cafeterias 17
Children, design of buildings for 6
Controls 18
Convenience outlets, electrical 18
Crutches, functioning of a person on 7
Dispensers,
- paper cup 17
- soap 17
- towel 17
- toilet paper 17

Door closers 11
Doors,
- minimum width of 11
- two leaf 11

Doorways, minimum width of 11
Electrical,
- controls, switches and convenience outlets 18

Entrances 11
Exits 11
Fire Alarms 18
Food service lanes in cafeteria 17
Hazards 18
Lighting of exterior ramps 18
Parking Spaces,
- Reserved for disabled 10
- Walkways from 10
- Dimensions of 10

Ramps, ... 12
- lighting 18
- on walks 8, 9

Reach, of adults in a wheelchair 7
Signs, at building entrances 11
Stairs 13
Stalls, toilet 14, 15, 16
Switches, electrical 18
Telephones, public 17
Thresholds 11

Toilet Rooms,.....14, 15, 16
accessories..... 17
Toilet Stalls..... 15, 16
Urinals, mounting of..... 17
Walks,.....8, 9, 10
from parking spaces..... 10
Warning Signals, audio and visual..... 18
Wash basins, design and mounting of..... 16
Water Closets, design and mounting of..... 15
Water fountains,
design and mounting of..... 17
recessed..... 17
Wheelchairs,
dimensions of..... 6
turning space..... 6, 7
space required for passing..... 7
reach of adults from..... 7

The National Building Code is published by the National Research Council as an advisory document for use throughout Canada. It is advisory only and has no legal standing until and unless adopted for specific use by a provincial government or municipal administration. The Code is essentially a set of minimum regulations respecting the safety of buildings with reference to public health, fire protection and structural efficiency. It is not and is not intended to be a textbook of building design, advice upon which should be sought from professional sources. The Code relates to buildings and simple structures but it is not intended for use with specialized civil engineering structures. Its essential purpose is the promotion of public safety through the use of desirable building standards throughout Canada.

The National Building Code and the various parts or sections as well as other supplements may be obtained by writing to:

The Secretary,
Associate Committee on the National Building Code,
National Research Council,
Ottawa, Canada

Printed in Canada